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Weed Control in Small Grain and Flax : 1989

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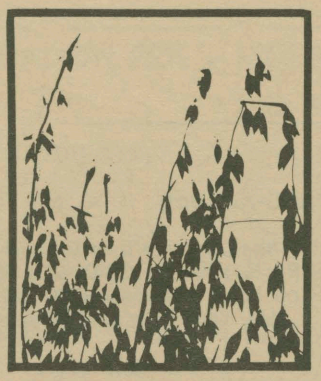

FS 525A

Weed Control in Small Grain and Flax: 1989

Cooperative Extension Service • South Dakota State University • U.S. Department of Agriculture

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Herbicides are a valuable supplement to and not a replacement for good rotations, clean seed, proper seedbed preparation, tillage, and crop competition.

Herbicide Suggestions

Information in this publication is based on research by the South Dakota Agricultural Experiment Station and other research or observations. Herbicides are included only after the chemical is registered by the Environmental Protection Agency (EPA) as to residue tolerances in crops used for food or feed.

This information provides a summary of herbicide uses and does not imply a guarantee. Tradenames are used for reader convenience and do not imply product endorsement. The label should be considered the final guide. Users are responsible for following label directions and precautions.

Weed Problems. Herbicide control is rated poor, fair, good, very good, or excellent for each weed problem in each crop.

Special Weed Problems. One section lists the best treatment for specific broadleaved weeds.

Herbicides. Most herbicides are listed by tradename except where the active ingredient is available in several products. The common name (in parentheses) follows the first listing of the tradename.

Rates. Rates for each treatment and each formulation are stated as the amount of product per acre. The amount of active ingredient or acid equivalent (act) per acre is stated for each formulation in parentheses.

Time To Apply. The best time to apply most treatments is based on crop and/or weed growth stage. Some herbicides are applied preemergence (after planting but before weeds or crop emerge). Some must be incorporated. Others are applied preplant incorporated (before planting).

Cost. The cost per acre for each treatment is based on average prices for the previous season or current season price information if available. The cost for low and high rates is listed. Prices vary. Consult your dealer for actual price.

Abbreviations Used

pt	= pint
qt	= quart
gal	= gallon
fl oz	= fluid ounce
oz	= ounce
lb	= pound
act	= actual or acid equivalent
lb/gal	= pound per gallon active
df	= dry flowable (spray)
gran	= granule
wsp	= water soluble powder
wdg	= water dispersible granule

SAFETY FIRST

Follow the Label. It is a violation of federal pesticide laws to use an herbicide in a manner inconsistent with its labeling. Read the entire label before using.

Applicator Safety. The most serious risk of exposure from chemicals is during handling and mixing operations with the concentrate product. Use protective equipment specified on the label. Chemical resistant gloves, eye shield, long sleeved clothing, rubber boots, and appropriate respirator should be used as required. In case of emergency, contact the Poison Control Center via 24 hours phone line:

McKennen Hospital, Sioux Falls, SD 1-800-952-0123
Dakota Midland Hospital, Aberdeen, SD 1-800-592-1889
Rapid City Regional Hospital, Rapid City, SD (605) 341-3333

Water Protection. Water quality is a public concern. Preventing spills and accidents during handling and mixing reduces risk of groundwater and surface water contamination. Mix herbicides away from wells and water sources. Prevent back siphoning into wells. Install anti-backflow devices in irrigation equipment used for pesticides. Triple rinse containers. Store herbicides properly. Identify high risk areas such as coarse soils or areas where the water table is near the surface. Be aware of herbicide properties that increase the risk of contamination in the critical areas.

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OATS (not underseeded to legumes)

MCPA AMINE or MCPA ESTER ($.80-1.65)

.5-1 pt MPCA amine 4L or .5-.66 pt MCPA ester 4L (.25-.5 or .25-.33 act)

SOME BROADLEAVES

Apply at 3- to 4-leaf stage of crop. At other growth stages, crop is more tolerant to the treatment than to other treatment. Crop least tolerant at boot to heading. Weeds must be small. MCPA is equal to 2,4-D on wild mustard, lambsquarters, and Canada thistle. MCPA is less effective than 2,4-D on larger broadleaved weeds. Poor control of kochia and wild buckwheat. Most situations require .66 to 1 pt/A. Do not graze dairy or slaughter animals on treated areas for 2 weeks after treatment.

2,4-D AMINE ($.60-.80)

.5-.66 pt 2,4-D amine 3.8L (.25-.33 act)

BROADLEAVES

Apply at 3- to 4-leaf stage of crop. Do not apply at boot to heading. Less crop tolerance than to MCPA. Oat varieties vary in tolerance to 2,4-D. Very good control of several annual broadleaves. Weak on wild buckwheat and kochia. Use higher rate for larger weeds or for perennials, but risk of crop injury increases. Do not graze dairy or slaughter animals on treated areas for 2 weeks after application.

Harvest aid application of 1 lb/A acid equiv may be made after the dough stage. Straw should not be used for feed.

BANVEL + MCPA AMINE (DICAMBA + MCPA) ($1.75-3.15)

.12-.25 pt Banvel 4L + .5-.75 pt MCPA 4L (.06-.12 + .25-.38 act)

WILD BUCKWHEAT SEVERAL ANNUAL BROADLEAVES

Tank-mix. Apply at 3- to 4-leaf stage of crop. Do not apply after the 4-leaf stage. Crop tolerance adequate; however, growth stage range is narrow. Applications after recommended growth stage frequently cause injury. Banvel may be used alone at .25 pt/A; however, it is usually used in combination with MCPA. Banvel gives excellent wild buckwheat and good kochia control. MCPA improves control of wild mustard. Rates of .12 to .18 pt Banvel plus .5 pt MCPA frequently used for small susceptible weeds and best crop tolerance. Use high Banvel rate for best kochia control. Minimum carrier is 5 gpa for ground and 3 gpa for air. Special 24(c) labeling allows minimum of 1 gpa carrier for aerial application with Banvel. Do not graze or harvest forage for livestock feed prior to crop maturity.

BUCTRIL (BROMOXYNIL) ($5.15-7.70)

1-1.5 pt Buctril 2L (.25-.38 act)

WILD BUCKWHEAT, SUNFLOWER, SOME ANNUAL BROADLEAVES

Apply at 2-leaf to early boot stage of crop. Fair crop tolerance. Risk of leaf burn under hot, humid conditions. Use lower rates for maximum crop safety. Rate of 1.5 pt Buctril suggested for most situations. Primarily where wild buckwheat is the major problem. Weeds should not be past the 3- to 4-leaf stage for best results. Not effective on perennials. Most frequently used with MCPA for broadspectrum weed control. Contact action. Good coverage required. Minimum carrier is 10 gpa for ground or 5 gpa for aerial. Do not graze treated areas for 30 days following application. May be underseeded to alfalfa.

BUCTRIL + MCPA (BROMOXYNIL + MCPA) ($5.70-8.65)

BRONATE

1-1.5 pt Buctril 2L + .5-1 pt MCPA 4L (.25-.38 + .25-.5 act)

1-1.5 pt Bronate

WILD BUCKWHEAT SUNFLOWER, KOCHIA, SEVERAL ANNUAL BROADLEAVES

Tank-mix or commercial premix. Bronate contains 2 lb/gal acid equiv each of bromoxynil and MPCA ester. Apply at the 3- to 4-leaf to early boot stage. Lower rates preferred for best crop safety. Very important to treat weeds when small. Excellent wild buckwheat and good kochia control. Very good control of several other annual broadleaves. Not for perennials. Low rate is for small weeds. Crop safety has been adequate in most tests. Leaf burn noted, especially under hot, humid conditions. Do not apply just before heavy frost. Good coverage required. Minimum carrier is 10 gpa for ground or 5 gpa for air. Do not graze treated areas for 30 days after application.

TORDON 22K + MCPA AMINE (PICLORAM + MCPA) ($1.75-2.20)

1 fl oz Tordon 22K 2L + .5-.75 pt MCPA amine 4L (.02 + .25-.38 act)

WILD BUCKWHEAT, SOME ANNUAL BROADLEAVES

Tank-mix. Apply at 3- to 5-leaf stage of crop when weeds are small. Excellent on wild buckwheat. Also controls some annual broadleaves such as mustard and lambsquarters. Poor kochia control. Used primarily where wild buckwheat is the major problem. Good crop tolerance. Do not plant susceptible broadleaved crops such as alfalfa, sunflowers, or soybeans the following year. Minimum carrier is 5 gpa for ground and 1 gpa for air. Consult label for all application directions and restrictions. Special Local Needs state registration. Restricted Use Pesticide. Crop use restrictions as for MCPA alone.

GLEAN + MCPA (CHLORSULFURON + MCPA) ($3.40-10.00)

.17-.5 oz Glean 75DF + .5-1 pt MCPA 4L (.007-.02 + .25-.5 act)

FOXTAIL, SEVERAL ANNUAL BROADLEAVES

Tank-mix. Postemergence only. Glean controls several annual weeds and provides extended weed control after harvest. Tank-mix reduces risk of developing resistant weed population. MCPA provides better crop tolerance than 2,4-D for oats. Amine or ester form may be used, ester preferred. Apply at 2- to 3-leaf stage of crop. Weeds should be small and actively growing. Rainfall after application improves results. Do not apply before crop emergence. Wild mustard, pigweed, and lambsquarters are most susceptible and can be controlled with .17-.33 oz/A product. Russian thistle, wild buckwheat, kochia, and foxtail are more difficult to control and require .33 to .5 oz/A product. Add surfactant at 1 to 2 pt/100 gallons of solution when used in combination with broadleaf herbicides. Crop tolerance is good. Do not apply if soil pH is over 7.9. Do not exceed .33 oz/A product on soil with pH over 6.5. Allow at least 48 month interval between Glean applications to further reduce development of resistant weeds. Minimum carrier is 3 gpa for ground and 1 gpa for air.

Treated fields may be planted to wheat, barley, or oats the following year under most situations. Refer to Glean in wheat, barley section for additional precautions and crop rotation limitations.

WHEAT, RYE, BARLEY
(not underseeded to legumes)

MCPA AMINE or MCPA ESTER ($.80-2.20)

.5-1 pt MCPA amine 4L or .5-1 pt MCPA ester 4L (.25-.5 act)

SOME BROADLEAVES

Selective, translocated herbicides for several annual broadleaves. Appear to be as effective as 2,4-D on wild mustard, lambsquarters and Canada thistle. Weeds must be small; early spraying is important. Less effective than 2,4-D on larger weeds. Kochia and wild buckwheat control usually unsatisfactory. Excellent crop tolerance. Less risk of injury than for other herbicides if applied at sensitive crop growth stages. Avoid spraying at boot to heading. Most situations require .66 to 1 pt/A. Ester or amine formulations usually used at the same rate. Ester forms have appeared slightly more effective on more species. Apply by air or ground. Do not graze dairy or slaughter animals on treated areas for 2 weeks after treatment.

WINTER WHEAT, RYE. Apply in the spring after tillering but before early boot. MCPA is not widely used on winter grains because other treatments frequently give better control of weed problems.

HARD RED SPRING WHEAT, DURUM, BARLEY. Apply from the 5-leaf to early boot stage. Used because of excellent crop tolerance at a wide range of stages. Frequently used in combination treatments.

2,4-D AMINE or 2,4-D ESTER ($.60-1.55)

.5-1 pt 2,4-D amine 3.8L or .5-1 pt 2,4-D ester 3.8L or .33-.66 pt 2,4-D ester 5.7L (.25-.5 act)

BROADLEAVES

Selective, translocated herbicide for several annual and perennial broadleaved weeds. Best choice for field bindweed or Canada thistle in many situations. Very good control of several annual broadleaves but less effective for kochia or wild buckwheat. Good crop tolerance at proper growth stage. Avoid treating at boot to heading. Better crop tolerance with amine. Ester usually used at slightly lower rate than amine. Rates of .33 lb/A acid equiv ester or .5 lb/A acid equiv amine have been satisfactory for most general broadleaved problems. Rate of .25 lb/A acid equiv will control small susceptible weeds such as wild mustard. Use maximum rate for perennials. Some labels allow rates to .75 lb/A acid equiv for improved perennial control if some crop injury can be tolerated. Apply by air or ground. Do not graze dairy or slaughter animals on treated areas for 2 weeks after application.

WINTER WHEAT, RYE. Apply in the spring when crop is fully tillered until early boot. Do not apply in the fall.

HARD RED SPRING WHEAT, DURUM, BARLEY. Apply from the 5-leaf to early boot stage after crop has tillered. Earlier treatment may reduce number of tillers.

BANVEL + MCPA or 2,4-D (DICAMBA + MCPA or 2,4-D) ($1.55-3.15)

WEEDMASTER

.12-.25 pt Banvel 4L + .5-.75 pt MCPA 4L or 2,4-D 3.8L (.06-.12 + .25-.38 act)

.75-1 pt Weedmaster

Tank-mix. Weedmaster commercial premix contains 1 lb dicamba + 2.8 lb 2,4-D amine per gallon. Weedmaster is labeled for wheat only. Excellent broadleaved weed control, including wild buckwheat and kochia. Banvel may be used alone; however, it is usually combined with MCPA or 2,4-D to improve control of several other broadleaved weeds. Application time usually too early for maximum perennial control. Crop stage is critical. Late applications may cause injury. Lower rates improve crop tolerance and may be adequate if conditions are favorable; however, even lower rates should not be applied past recommended crop stages. Rate of .17 pt Banvel + .5 pt MCPA or 2,4-D amine suggested for most situations. Use lower rates for small susceptible weeds under favorable growing conditions. Use higher Banvel rates for best kochia control. Weedmaster at .75 pt provides .08 lb dicamba and .3 lb 2,4-D amine. MCPA in the combination gives best crop safety. Amine form of MCPA or 2,4-D preferred; ester forms not recommended. Minimum carrier is 5 gpa for ground and 3 gpa for air. Special 24(c) labeling allows minimum of 1 gpa carrier for aerial application with Banvel. Do not graze or harvest forage for livestock feed prior to crop maturity.

WINTER WHEAT. Apply in the spring before jointing stage of crop. Primarily for severe kochia. Wild buckwheat and other weeds frequently not emerged at proper time to spray. Not for rye.

HARD RED SPRING WHEAT, DURUM. Apply at the 3- to 4-leaf crop stage for best tolerance. Do not apply if the crop exceeds the 5-leaf stage. Durum may be slightly less tolerant than hard red spring.

BARLEY. Tank-mix only. Label suggests .12 to .19 pt Banvel + .5 pt MCPA per acre at the 2- to 3-leaf crop stage. Marginal crop tolerance. Applications in barley frequently result in excessive injury when applied after the 3-leaf stage. Other alternatives provide greater crop tolerance if weeds are not emerged or spraying is delayed.

BUCTRIL (BROMOXYNIL) ($5.15-10.30)

1-2 pt Buctril 2L (.25-.5 act)

WILD BUCKWHEAT, SUNFLOWER, SOME ANNUAL BROADLEAVES

Contact herbicide for several annual broadleaved weeds. Excellent wild buckwheat control. Usually used in combination with MCPA or 2,4-D to improve control of several broadleaves. Not effective on perennials. Very good crop tolerance at a wide range of growth stages. Weeds must be small. Rate of 1.5 pt Buctril per acre suggested for most situations. Higher rate for larger weeds. Minimum carrier is 10 gpa for ground or 5 gpa for air. Do not graze treated areas for 30 days following application. May be underseeded to alfalfa.

WINTER WHEAT, RYE. Usually applied in spring before crop has reached boot stage. May be applied in fall for winter annuals. Buctril rate is 1.5 to 2 pt/A.

HARD RED SPRING WHEAT, DURUM, BARLEY. Apply at 2-leaf to early boot stage of crop. Buctril rate is 1 to 1.5 pt/A.

BUCTRIL + MCPA or 2,4-D (BROMOXYNIL + MCPA or 2,4-D) ($5.70-11.35)

BRONATE

1-2 pt Buctril 2L + .5-1 pt MCPA 4L or 2,4-D 3.8L (.25-.5 + .25-.5 act)

1-2 pt Bronate

WILD BUCKWHEAT, SUNFLOWER, SEVERAL ANNUAL BROADLEAVES

Tank-mix or commercial premix. Bronate contains 2 lb/gal acid equiv each of bromoxynil and MCPA ester. Broadspectrum annual broadleaved control. Excellent wild buckwheat and good kochia control. Not for perennials. Weeds should be in the 1- to 4-leaf stage. Control of large weeds is less satisfactory. Very good crop tolerance at a wide range of growth stages. Rate of .25 (bromoxynil) + .25 (MCPA or 2,4-D) lb/A acid equiv has been satisfactory for small weeds under favorable growing conditions. Use .38 lb/A acid equiv of each for larger weeds or less favorable conditions. Use high rates of MCPA or 2,4-D for best perennial weed control. An additional .25 lb/A acid equiv MCPA may be added to the rates listed in the combination. MCPA preferred for the tank-mix for best crop safety or for spraying at early crop leaf stages. Ester formulations suggested. Avoid treating prior to heavy frost. Good coverage important. Minimum carrier is 10 gpa for ground or 5 gpa for air. Do not graze treated areas for 30 days after application.

WINTER WHEAT, RYE. Apply in spring after tillering to early boot crop stage. Buctril rate is 1.5 to 2 pt/A.

HARD RED SPRING WHEAT, DURUM, BARLEY. Apply at the 3- to 4-leaf to early boot crop stage. Buctril rate is 1 to 1.5 pt/A.

BANVEL + BUCTRIL (DICAMBA + BROMOXYNIL) ($5.60-9.70)

BANVEL + BRONATE ($5.25-10.50)

.06-.25 pt Banvel 4L + 1-1.5pt Buctril 2L (.03-.12 + .25-.38 act)

.12-.25 pt Banvel 4L + .75-1.5 pt Bronate

MOST ANNUAL BROADLEAVES

Tank-mix. Excellent control of kochia, wild buckwheat, and other annual broadleaves. Adequate crop tolerance if applied at proper stage. Limited data. Lower Banvel rate improves crop tolerance. Maximum of .17 pt Banvel suggested for most situations. Lower rates may provide sufficient activity, especially with the higher bromoxynil rate and with the bromoxynil + MCPA combinations. Use higher bromoxynil rate for larger weeds. Apply as for Buctril alone.

WINTER WHEAT. Apply in spring before jointing. Includes all combinations.

HARD RED SPRING WHEAT. Apply at the 2- to 4-leaf crop stage. Includes Banvel + Buctril.

TORDON 22K + MCPA or 2,4-D (PICLORAM + MCPA or 2,4-D) ($1.45-2.20)

1-1.5 fl oz Tordon 22K 2L + .5-.75 pt MCPA 4L or 2,4-D 3.8L (.015-.02 + .25-.38 act)

WILD BUCKWHEAT, SOME ANNUAL BROADLEAVES

Tank-mix. Selective, translocated herbicide for annual broadleaves. Used primarily where wild buckwheat is the major problem. MCPA or 2,4-D improves control of other broadleaves. Poor kochia control. Acceptable crop tolerance. Avoid late spraying. Low rates are for small weeds under favorable conditions. MCPA amine or ester or 2,4-D amine in the tank-mix appears to offer better crop tolerance than with 2,4-D ester. Use proportionately less 2,4-D for 5.7L product. Do not plant susceptible broadleaved crops such as alfalfa, sunflowers, or soybeans the following year. Minimum carrier is 5 gpa for ground or 1 gpa for air. Consult label for all application directions and precautions. Special Local Needs state registration. Restricted Use Pesticide.

WINTER WHEAT. Apply in spring after tillering to early boot. Not for rye.

HARD RED SPRING WHEAT, BARLEY. Apply at the 3- to 5-leaf crop stage. Not for durum.

CURTAIL (CLOPYRALID + 2,4-D AMINE) ($6.00)

2 pt Curtail .38 + 2 lb/gal (.09 + .5 act)

CANADA THISTLE, ANNUAL BROADLEAVES

Commercial premix. Apply after crop begins tillering to early jointing stage. Crop tolerance is good. Clopyralid gives excellent seasonal control of Canada thistle; 2,4-D amine in the premix improves control of several other broadleaved weeds including mustard, lambsquarters, sunflower, and cocklebur. Kochia control is variable. Canada thistle control has been excellent. Thistle should not exceed 6 inches or be past bud stage. Curtail may be tank-mixed with an additional .5 lb act 2,4-D to control larger weeds; however, crop tolerance is reduced. Bromoxynil, Glean, Banvel, or Avenge may also be tank-mixed with Curtail to improve broadleaf or wild oat control or provide residual control, depending on the product. Minimum carrier is 5 gpa for ground or 2 gpa for air. Do not harvest hay from treated fields. Do not rotate to any crop except small grain or grass forages for one year after treatment. Carryover is possible in dry or cool seasonal conditions.

WINTER WHEAT, HARD RED SPRING WHEAT, DURUM, BARLEY. Apply in spring after tillering begins up to jointing stage.

TREFLAN (TRIFLURALIN) ($3.35-5.05)

1-1.5 pt Treflan 4L or 5-7.5 lb Treflan 10G (.5-.75 act)

FOXTAIL

Spring Application After Planting, Shallow Incorporated. Liquid formulation. Incorporate 1 to 1.5 inches deep with two flextine or spike-tooth harrowings. Immediate incorporate preferred but may be delayed up to 24 hours if soil surface is dry and there is little wind. Excessive residue should be incorporated before planting. Seed must be planted 2 to 3 inches deep so it is below the treated soil layer. Use the low rate on light, low organic matter soil and the high rate on heavy, clay soil. The 1.25 pt/A rate has been satisfactory in most SDSU tests. Foxtail control has been very consistent, except with extremely dry topsoil. Does not control wild oats. Very good crop tolerance if seed planted below treated soil. Better crop tolerance than fall incorporated application. Minimum carrier is 5 gpa. Do not plant oats or sorghum the following year. Preferred application method for most situations.

Spring Preplant Incorporated. Barley only. Spray or granules. Use rate of 1 pt/A for Treflan 4L or 5 lb/A for Treflan 10G. Incorporate within 24 hours using a tandem disk or properly equipped field cultivator. Complete incorporation with a second pass before planting; for granules allow at least 7 days before the second pass.

Fall Applied Preplant Incorporated. Granules preferred. Apply after September 1. Crop residues should be worked to a manageable level before application. Granules may be applied into standing stubble. Incorporate one time within 24 hours. The second incorporation should be in the spring before planting. A chisel (three rows of narrow spaced sweeps) set 4 to 5 inches deep, tandem disk set 3 to 4 inches deep or field cultivator may be used for the initial pass. A disk or field cultivator should be used for the second pass. Very consistent foxtail control. Weed control will be more consistent under dry conditions. For spring wheat, use the low rate for light and medium textured soil and the high rate for heavy, clay soil. For barley, use the low rate for light soil and the high rate for medium and heavy soil. Crop tolerance may be adequate; however some stand reduction may be noted in certain conditions. Spring post-plant application preferred for most situations. Application directions and precautions same as for spring application.

HARD RED SPRING WHEAT, DURUM, BARLEY. Apply liquid in spring after planting and incorporate shallowly or apply in the fall and incorporate. Apply granules in fall and incorporate. May be applied in the spring preplant and incorporated before planting for barley only. Not for winter wheat or rye.

HARMONY (M6316)

.33-.66 oz Harmony 75DF (.02-.04 lb act) ($3.35-6.75)

HARMONY + 2,4-D or MCPA or BUCTRIL

.33-.66 oz Harmony 75DF + .25-.75 pt MCPA ester 4L ($3.90-8.25)

.33-.66 oz Harmony 75DF + .25-.5 pt 2,4-D ester 3.8L ($3.75-7.70)

.33-.66 oz Harmony 75DF + 1-1.5 pt Buctril 2L ($8.50-14.55)

SEVERAL ANNUAL BROADLEAVES

Harmony controls several annual broadleaved weeds in wheat and barley. Gives very good to excellent control of mustard, kochia, Russian thistle, wild sunflower and wild buckwheat. Weeds should be actively growing and free of moisture stress. Grass is not controlled. Apply after weeds are emerged but before they are 4 inches tall or across. Crop tolerance is very good. There is no carryover restrictions for any crops planted 60 days after application.

Apply .33 to .66 oz/A of 75DF. The low rate is for light infestations only. Use .5 to .66 oz/A for most situations and if wild buckwheat is a significant part of the problem. Add surfactant at 1 qt/100 gallons of solution. Minimum carrier is 5 gpa for ground and 3 to 5 gpa for air. May be applied in liquid nitrogen fertilizer carrier.

Tank-mix with low rates of other herbicides used for broadleaf control will improve consistency and is suggested for most situations. It is strongly suggested to reduce the risk of resistant weeds where other related herbicides such as Glean or Ally may be used at some point in the rotation. May be tank-mixed with Hoelon for foxtail or wild oat control; surfactant not required. Several tank-mix combinations are listed. Refer to the section for each product used alone.

WINTER WHEAT. Postemergence after the crop is in the 2-leaf stage but before the 3rd node is detectable.

SPRING WHEAT AND BARLEY. Postemergence after the crop is in the 2-leaf stage but before the 1st node is detectable.

ALLY (METSULFURON)

0.1 oz Ally 60DF (.004 act) ($2.65)

ALLY + 2,4-D or MCPA or BANVEL

0.1 oz Ally 60DF + .25-.5 pt 2,4-D 3.8L ($3.00-3.45)

0.1 oz Ally 60DF + .25-.75 pt MCPA 4L ($3.15-4.30)

0.1 oz Ally 60DF + .12-.25 pt Banvel 4L ($3.60-4.50)

SEVERAL ANNUAL BROADLEAVES

Tank-mix preferred. Ally controls several annual broadleaves in wheat and barley. Labeled for statewide use. Residual properties extend control for 1 to 6 weeks. Pennycress, pigweed, prickly lettuce, wild mustard, and volunteer sunflower are among species most susceptible. Kochia, wild buckwheat, Russian thistle, and tansy mustard are controlled or suppressed, depending on weed size and rainfall. Ally will not control wild oats or grasses. Results in field tests have been very good. The addition of low rates of 2,4-D or MCPA improves control, especially if weeds are larger. Ester forms perform best; surfactant can be reduced to 1 to 2 pt/100 gal solution. Lower rates of 2,4-D or MCPA are adequate for susceptible weeds. Surfactant improves control; crop tolerance may be reduced when used with the high rates of some combinations. Results on large mustard have been very good. Symptoms develop slowly; discoloration may not appear for 1 to 3 weeks. Crop tolerance appears adequate at recommended rates. For best results, apply after weeds have emerged but before they are 4 inches tall/across. Rainfall after application improves results. Use a surfactant that is at least 80% active as directed. Do not use on soil with pH over 7.9. Apply in minimum of 1 gpa for air or 3 gpa for ground equipment.

Special management of Ally in the herbicide program is required to reduce the risk of developing a population of weeds resistant to the sulfonyl urea herbicides. This is especially important in fields with a 3 or 4 year history of annual Glean or Ally use. Ally should not be applied more frequently than once in 22 months and should not be used within 22 months before or after Glean. Ally should be used postemergence in a tank-mix combination with low rates of other broadleaf herbicides. Tillage, crop rotation, and other herbicides in the program will further reduce the risk of developing an expanding resistant population. Several tank-mixes with suggested rates are listed.
Follow rotational guidelines. Winter or spring wheat may be planted after 1 month; durum, barley, or oats after 10 months; flax, safflower, corn, and sunflower after 22 months. Grain sorghum or proso millet in the south part of the state (south of Hwy. 212, east of the Missouri River and south of Hwy. 34 west of the Missouri River) may be planted after 12 months if there has been 12 inches of precipitation between application and planting. Pending changes allow planting field corn after 12 months east of the Missouri River and west of the Missouri River south of Hwy. 34 if there has been 15 inches of precipitation since application. Allow 34 months or more for other crops.

WINTER WHEAT. Tank-mix. Postemergence in spring when weeds are small and before boot stage. Use 1 to 2 qt surfactant per 100 gal of solution. Use lower rate for combinations.

SPRING WHEAT, BARLEY. Tank-mix. Postemergence from 2-leaf to early boot stage when weeds are small. Use 1 to 2 pt surfactant per 100 gal of solution.

DURUM.Tank-mix. Postemergence after durum is fully tillered but before boot stage. Use MCPA or 2,4-D tank-mix for durum.

GLEAN (CHLORSULFURON)

GLEAN + 2,4-D or MCPA or BUCTRIL or BRONATE or BANVEL

.17-.5 oz Glean 75DF (.007-.02 act)	($3.05-8.90)
.12-.33 oz Glean 75DF + .25-.5 pt 2,4-D 3.8L	($2.50-6.65)
.12-.33 oz Glean 75DF + .25-.75 pt MCPA 4L	($2.65-7.40)
.12-.33 oz Glean 75DF + .75-1.5 pt Buctril 2L	($6.05-13.70)
.12-.33 oz Glean 75DF + .75-1.5 pt Bronate	($6.45-14.50)
.17-.5 oz Glean 75DF + .12-.25 pt Banvel 4L	($3.95-10.80)

FOXTAILS AND MOST ANNUAL BROADLEAVES

Tank-mix preferred. Glean controls several annual weeds in wheat and barley. It has residual properties that extend weed control after harvest or into fallow. Wild mustard, pennycress, pigweed, and lambsquarters are most susceptible and can be controlled with .17 to .33 oz/A product. Russian thistle, wild buckwheat, kochia, and foxtail are suppressed and require .33 to .5 oz/A product. Wild oat and downy brome are not controlled. Weed control has been excellent to very good in most situations. Some rainfall soon after application improves performance. Excellent wheat tolerance to spring application. Barley is less tolerant than wheat. Crop injury can result from treatments when crop is under stress. Heavy rainfall soon after application may cause temporary discoloration. Soil pH is also used to determine rate.

Special management of Glean in the herbicide program is required to reduce the risk of developing a population of weeds resistant to the sulfonyl urea herbicides. This is especially important on fields with a 3- or 4-year history of annual Glean applications. Glean should not be applied more frequently than once every 48 months. Use Glean postemergence in the spring and tank-mix with low rates of other unrelated broadleaf herbicides. Tillage, crop rotation, and other herbicides in fallow further reduce risk of developing an expanding resistant population. Several tank-mix combinations with suggested rates are listed.

Tank-mix combinations with suggested rates for postemergence applications. Ester forms of 2,4-D or MCPA have performed better than amines. A surfactant such as X-77 at 1-2 qt/100 gallons of solution is suggested, especially for foxtail, kochia, and wild buckwheat. Maximum surfactant for tank-mixes is 1 qt/100 gallons. The lower rate range is satisfactory for most situations. The higher rate is required if tolerant or resistant weeds are anticipated in the population. Surfactant improves control; crop tolerance may be reduced when used with the combinations.

Soil carryover increases under high soil pH (over 7.0), low rainfall (under 20 inches), cool soil temperature (under 40 degrees F.), and with high rates. Small quantities of Glean remaining in the soil can injure crops other than wheat, barley, or oats for 2 years or longer at soil pH 6.5 or lower, and up to 3 years or longer for pH 6.6 to 7.9. On soils over pH 7.0, a 4-year interval may be required for sensitive crops. The season before planting crops other than wheat, barley, or oats, a test strip of the crop to be planted must be grown to maturity. An untreated check strip, also planted to the test crop, will improve ability to evaluate carryover. Wheat or barley may be planted into treated areas according to the following intervals (given in months):

Soil pH	Under 6.5	Under 6.5	6.6-7.9	Over 7.9
Rate Used	1/6-1/3 oz	1/2 oz	1/6-1/3 oz	
Wheat	0	4	0	DO
Barley	10	10	16	NOT
Oats	10	10	10	USE

Do not apply Glean on soils with pH over 7.9. Do not exceed .33 oz/A product on soil with pH over 6.6. Avoid swath overlap or drift. Use extra care to clean tank, line, and boom as small quantities can injure susceptible crops. Flush hoses and boom for 10 minutes; then add .5 gal chlorine bleach per 100 gallons of water. Flush equipment, operate sprayer system for 15 minutes. Repeat the flush operation and drain. Remove screens and nozzles. Do not use bleach with ammonia. Minimum carrier is 3 gpa for ground or 1 gpa for air.

WINTER WHEAT, HARD RED SPRING WHEAT, DURUM, BARLEY. Postemergence to Crop. Preferred timing for application. Suggest a tank-mix with another herbicide using specified rates of Glean. Apply Glean at .17 to .5 oz/A when weeds are less than 2 inches tall or 2 inches in diameter. Apply after crop is in the 2-leaf stage, but before boot stage. Has been the best program for weed control in the crop. Good crop tolerance. The high rate usually gives some weed control in the stubble. Refer to tank-mix suggestions.

WINTER WHEAT, HARD RED SPRING WHEAT, DURUM. Preemergence. Glean only. Apply Glean at .17 to .33 oz/A after planting but before crop emerges. Rainfall within 2 weeks is required.

HARD RED SPRING WHEAT, DURUM. Fall Application. Apply Glean at .33 oz/A in the fall in stubble or on tilled ground. Tillage after application must be shallow and uniform.

WINTER WHEAT, HARD RED SPRING WHEAT, DURUM. Split Treatment. For soils with less than 6.5 pH. Plant crop at least 1 inch deep. Apply .25 oz/A or less each time, preemergence, postemergence, or late postemergence. Allow 30 days between applications. Do not apply after boot stage. Not widely used.

WINTER WHEAT. Preplant incorporated or preplant and incorporated with drill. Use .25 to .33 oz/A. After planting or postemergence preferred. Only for early seeded under favorable moisture and temperature. Risk of injury for late planted or stressed crop.

FAR-GO or SHOWDOWN (TRIALLATE) ($9.35-11.70)

1-1.25 qt Far-go 4L or 12.5-15 lb Far-go 10G or 6.3-7.5 lb Showdown 20G (1-1.25 or 1.25-1.5 act)

WILD OATS

Spring Application. Far-go 4L or Far-go 10G. For wild oats. Control is fair to very good. Spray formulation preferred. Far-go 4L should be incorporated immediately into the top 2 inches of soil either before seeding or after planting with two harrowings. Use 1 qt/A for spring and durum wheat or 1.25 qt/A for barley. Far-go 10G may be incorporated before seeding barley as for 4L or after planting and incorporated immediately into the top 2 inches of soil with two harrowings for spring wheat, durum or barley using 10 to 12.5 lb/A. Use the low rate when seeding wheat with a press drill. Best wheat tolerance when applied after planting.

Fall Application. Far-go 4L, Far-go 10G or Showdown 20G. For wild oat. Use Far-go 10G at 12.5 to 15 lb/A or (Showdown 20G) at 6.3 to 7.5 lb/A and incorporate. Granules should be applied within 3 weeks of soil freeze-up. Stubble fields should be worked with a field cultivator or disk before application. Incorporate granules into top 2 inches of soil within 48 hours using a field cultivator or other suitable equipment. Spring seedbed tillage must be shallow.

DOWNY BROME

Fall Application. Far-go 10G. For downy brome (cheatgrass) suppression. Apply 15 lb/A before seeding and incorporate. The granules may be shallowly incorporated or applied to the surface when using no-till seeding equipment. Limited tests. For no-till systems, apply 15 lb/A to the surface before seeding. Use hoe-drill only.

HARD RED SPRING WHEAT, DURUM, BARLEY. Apply in spring or fall as shown above for wild oat control.

TREFLAN + FAR-GO (TRIFLURALIN + TRIALLATE) ($12.70-16.75)

BUCKLE

1-1.5 pt Treflan 4L + 1-1.25 qt Far-go 4L (.5-.75 + 1-1.25 act)

FOXTAIL, WILD OATS

Tank-mix. Spring applications only. Apply after planting and incorporate as for Far-go alone. Adjust rates for soil type. Consistent control. Rates of 1 pt/A Treflan + 1 qt/A Far-go per acre have been satisfactory in most SDSU test. Maximum Far-go rate for barley is 1.25 qt/A and wheat is 1 qt/A. Refer to application directions and precautions for each product used alone. Do not mix granules or liquid for fall application. Unless the wild oat problem is very spotty, consider applying Far-go granules in the fall and Treflan liquid in the spring after planting if the spring applied tank-mix is not used.

10-12.5 lb Buckle

Premix. Buckle is a granule containing 10% triallate (Far-go) + 3% trifluralin (Treflan). Fall application for durum wheat and barley only. Apply within 3 weeks of normal freeze-up and incorporate within 24 hours. Use a chisel or field cultivator in fall. Perform a shallow tillage in spring before planting if only one fall incorporation. Do not rotate to corn, oats, sorghum, or proso millet for 16 months.

HARD RED SPRING WHEAT, DURUM, BARLEY. Apply in spring or fall as shown above. Premix granule for durum or barley only in fall and barley only in spring. Not for winter wheat or rye.

HOELON (DICLOFOP) ($12.85-21.40)

2-3.33 pt Hoelon (.75-1.25 act)

WILD OATS, FOXTAIL

For postemergence wild oat and foxtail control. Weeds should be in the 1 to 3-leaf stage for best results. Control has been consistent when applied at the proper weed stage. Do not treat weeds larger than specified for the rate and crop. Use lowest rate only for weeds in the 1- to 2-leaf stage and when growing conditions are favorable. The 2.66 pt/A rate is suggested for most other situations. Adequate crop tolerance. Wheat is more tolerant than barley. Some crop leaf discoloration occurs under stress conditions. Do not tank-mix with herbicides other than those labeled, as weed control may be reduced. Do not apply herbicides other than those listed within 5 days of Hoelon application. Minimum carrier is 10 gpa for ground and 5 gpa for air. Do not graze or harvest from treated fields. Restricted Use Pesticide.

DOWNY BROME

For preplant incorporated application to control downy brome (cheatgrass) in winter wheat. New supplemental label for certain states. Weed control in some tests in other states has been satisfactory. Results from limited SDSU tests have been variable. Additional research and field scale tests are planned. Incorporate within 48 hours to a depth of 2 to 3 inches. Incorporate twice to insure uniformity. Existing crop residue should be mixed into the soil before application. Rate is 2 to 3.33 pt/A; use the higher rate for heavy infestations.

WINTER WHEAT. Apply postemergence in spring to control foxtail and wild oats as for spring wheat. Not for rye. Apply in the fall preplant incorporated for downy bromegrass control.

HARD RED SPRING WHEAT, DURUM. Apply when foxtail or wild oats is in the 1- to 4-leaf stage. Use 2 to 2.66 pt/A when weeds have 1 to 3 leaves. Rates of 2.66 to 3.33 pt/A may be used when weeds have 3 to 4 leaves. Do not treat past 4-leaf stage of weeds. Crop oil concentrate at .5-1 pt/A for air or 1-2 pt/A for ground application may improve grass control under drought conditions. Do not use oil additive with Hoelon rates above 2.66 pt/A or with bromoxynil tank-mixes.

BARLEY. Apply when foxtail and wild oats are in the 1- to 3-leaf stage. Use 2 to 2.66 pt/A. Do not treat past the 3-leaf stage of weeds. Do not exceed 2.66 pt rate or use crop oil additive. Do not treat barley under cold prolonged wet conditions.

2-3.5 pt Hoelon 3E + 1-2 pt Buctril 2L ($18.00-32.40)

2.66-3.33 pt Hoelon 3E + 1 pt Buctril 2L + 1.5 fl oz MCPA ester 4L ($22.45-26.80)

One-Shot

2.66-3.33 pt Hoelon 3E + .17-.25 oz Glean 75DF ($20.15-25.90)

2-3.33 pt Hoelon 3E + .33-.66 oz Harmony 75DF ($16.25-27.95)

Tank-mixes. Combinations control annual broadleaves or provide residual control. Minimum carrier is 10 gpa for ground or 5 gpa for air. Do not mix with 2,4-D or use crop oil additives. Combination with bromoxynil + MCPA includes a low rate of MCPA primarily for wild mustard control. Higher rates increase risk of antagonistic reaction with Hoelon. One Shot is a commercial 3-way premix containing 1.88 lb diclofop + .58 lb bromoxynil + .12 lb MCPA per gallon. Apply 3.45 pt/A. Each 2.6 gal container will treat 6 acres. This is equivalent to .8 lb (2.1 pt Hoelon), .25 lb bromoxynil, and .045 lb actual MCPA per acre. Combination with Glean provides control of several small emerged annual broadleaves and gives residual control into the season. Combination with Harmony provides control of emerged annual broadleaves with no carryover limitations for the next season. No surfactant needed.

ASSERT (IMAZAMETHABENZ) ($15.90-19.90)

1.2-1.6 pt Assert 2L (.3 - .38 act)

WILD OATS

For postemergence wild mustard and wild oat control. Wild mustard should be in the seedling stage and be treated before bloom. Wild oat should be at the 1- to 4-leaf stage. Control has been excellent in most SDSU tests, except under severe moisture stress. Does not control foxtail. Suppresses growth on wild buckwheat. Control is best if weeds are growing actively. Weed response takes several days and is extended if conditions are dry. Crop tolerance is very good. Labeling includes tank-mixes with MCPA ester 2,4-D ester, Harmony or Bronate for improved broadleaf control. Fields treated with Assert may be rotated to barley, corn, sunflowers, wheat or potatoes; other crops should not be planted for 15 months. Treated fields should not be grazed or cut for forage, but straw may be fed or used for bedding. Minimum carrier is 8 gpa for ground or 5 gpa for air. If using over 10 gpa, add .3 fl oz non-ionic surfactant or crop oil for each gallon in excess of 10. May be applied in fluid nitrogen fertilizer.

WINTER WHEAT, SPRING WHEAT, DURUM, and BARLEY. Apply postemergence. Use 1.2-1.6 pt/A. Use the high rate and increase minimum carrier to 15 gpa for infestations over 25 plants per square foot.

TANK-MIXES. Assert may be tank-mixed with other herbicides. Use the labeled rate as for Assert alone and add the other herbicide according to label use rates or the amount required for the weed. Do not mix Assert with amine forms of MCPA or 2,4-D or with Banvel. Antagonism has not been fully evaluated in SDSU tests. Several tank-mixes are listed below with suggested rates.

1.2-1.5 pt Assert + .5-1 pt MCPA ester 4L or 2,4-D ester 3.8L ($16.70-22.10)

1.2-1.5 pt Assert + 1-1.5 pt Buctril 2L + .5-.75 pt MCPA ester 4L ($22.15-29.35)

1.2-1.5 pt Assert + .17-.33 oz Glean 75DF or .1 oz Ally ($18.55-25.75)

AVENGE (DIFENZOQUAT)

2.25-4 pt Avenge 2L (.66-1 act) ($12.90-19.55)

WILD OATS

For postemergence wild oat control. Apply when wild oats is in the 3- to 5-leaf stage. Wild oat is most susceptible at the 5-leaf stage. The 3 pt/A is suggested for most light to moderate infestations in wheat. High rate is for early application and for high weed densities over 25 plants/square foot. Best results under good growing conditions. Do not apply when plants are wet or under drought stress. Do not apply after crop flag leaf is exposed. Minimum carrier is 5 gpa for ground and 3 gpa for air. Add surfactant for carrier volumes over 10 gpa. Do not graze or harvest forage from treated fields.

WINTER WHEAT. Limited data or experience because wild oat in winter wheat is not a widespread problem. Reports indicate adequate crop tolerance. Some winter wheat varieties are sensitive. Not for rye.

HARD RED SPRING WHEAT, DURUM, BARLEY. Use only on Benito, Butte, Canuck, Chester, Glenlea, HY320, Katepwa, Marbert, Neepawa, NK(PB)751, Olaf, Era, Kitt, Fortuna, Solar, Colteau, Walera, Probrand 711, Marshall, Wheaton, Probrand 715, Oslo, Pioneer 2369, Pondera, Apex, Buckshot, Centa, Columbus, Courtney, Erik, Glenman, Leader, McKay, Newana, Norak, Norana, Prodax, Stoa, Success, Victory. Do not treat unlabeled varieties as injury can be substantial. Labeled varieties appear to have adequate tolerance under favorable growing condi tions. Durum, except Vic, Edmore, Laker, Lakota, Wascona, Wakooma, Westbred 802, and Westbred 881, may be treated. Barley is more tolerant than spring wheat.

2.5-4 pt Avenge 2L + .5-2 pt MCPA 4L or .5-1.5 pt 2,4-D 3.8L ($13.55-22.85)

2.5-4 pt Avenge 2L + 1-2 pt Buctril 2L ($18.05-29.85)

2.5-4 pt Avenge 2L + 1-2 pt Bronate ($18.60-30.90)

2.5-4 pt Avenge 2L + .17-.5 oz Glean 75DF ($15.95-28.45)

2.5-4 pt Avenge 2L + .1 oz Ally 60DF ($15.55-22.20)

2.4-4 pt Avenge 2L + .33-.66 oz Harmony 75DF

WILD OATS, SEVERAL BROADLEAVES

Tank-mixes. Combination with 2,4-D preferred for perennials. Combination with Glean provides control of small annual weeds and residual control. In most situations, Glean may provide better control if applied earlier when weeds are smaller. Bromoxynil combinations primarily for small, annual broadleaves. Combination with Ally improves control of annual broadleaves. Combination with Harmony controls annual broadleaves with no crop rotation limitations for the next season. No surfactant needed. Follow rate suggestions listed for MCPA, 2,4-D, bromoxynil, or Glean alone as some rates listed in the above combinations are higher than recommended for safe use. Use minimum of 5 gpa for ground or aerial application of MCPA or 2,4-D tank-mix. Use minimum of 10 gpa for ground or 5 gpa for aerial application of bromoxynil tank-mix. Use minimum of 5 gpa for ground or 3 gpa for aerial application of Glean or Harmony tank-mix. Refer to section for each herbicide used alone foi specific crop and application directions.

FLAX

MCPA AMINE or MCPA ESTER ($.80-1.10)

.5 pt MCPA amine 4L or .5 pt MCPA ester 4L (.25 act)

FEW BROADLEAVES

Apply when flax is 2 to 6 inches tall but before buds form. Treat before weeds are 4 inches tall. Fair to good control of mustard and lambsquarters. Poor on kochia or wild buckwheat. Fair to good crop tolerance. Better crop tolerance and improved weed control when sprayed early. Usually applied in combination with Dowpon. Avoid treating during drought stress. Flax may be underseeded to alfalfa. Not labeled for preharvest application.

BUCTRIL (BROMOXYNIL) ($5.15)

1 pt Buctril 2L (.25 act)

WILD BUCKWHEAT, SUNFLOWER, SOME ANNUAL BROADLEAVES	Apply when flax is 2 to 8 inches tall and weeds are in 2- to 4-leaf stage. Excellent wild buckwheat and good kochia control. Used in flax primarily for dense infestations of these weeds. Also controls several other annual broadleaves but is weak on wild mustard. Fair to good crop tolerance. Best crop tolerance when flax is small. Do not apply at bud stage or in humid weather when temperature is over 85 degrees F. Use .25 to .38 lb/A acid equiv for most situations. More risk of crop leaf burn with high rate. Not recommended in combination with other herbicides because of crop injury. Minimum carrier is 10 gpa for ground and 5 gpa for air. Do not use on flax underseeded to alfalfa.

TREFLAN (TRIFLURALIN) ($3.35-6.70)

1-2 pt Treflan 4L or 5-10 lb Treflan 10G (.5-1 act)

FOXTAIL	Apply in the fall and incorporate. Not approved for spring application. Granules preferred, especially with heavy residue. Apply after September 1. Crop residue should be worked to a manageable level before application; however, granules may be applied into standing stubble. Incorporate one time within 24 hours. A chisel (three rows of narrow spaced sweeps) set 4 to 5 inches deep, tandem disk set 3 to 4 inches deep, or field cultivator may be used for the first pass. A disk or field cultivator should be used for the second pass. Make second pass at a right angle. Use low rates for light, sandy soil. Rate of 1.5 pt or 7.5 lb granules suggested for most soils. Very consistent weed control. Crop tolerance is fair; however, some thinning may occur under poor emergence conditions. Slight reductions seldom affect yield. Seedbed should be firm. Delay seeding until seedbed warms. Seed with a press or hoe drill. Seed less than 1.5 inches deep. Minimum carrier is 5 gpa. Consult Treflan label for other precautions.

RAMROD (PROPACHLOR) ($16.60)

4 qt Ramrod 4L (4 lb act)

FOXTAIL	Preemergence. Apply before weeds emerge. Gives very good to excellent control of foxtail. Does not control broadleaves. Rainfall required. Crop tolerance is adequate; some stunting at emergence may be noted under wet, cold conditions. Minimum carrier is 15 gpa. Not labeled for flax underseeded to alfalfa.

HOELON (DICLOFOP) ($12.85-17.10)

2-2.66 pt Hoelon 3L (.75-1 act)

WILD OATS FOXTAIL	For postemergence wild oat and foxtail control. Weeds should be in the 1- to 3-leaf stage for best results. Use the high rate if weeds are in the 3- to 4-leaf stage. Avoid treating larger weeds. Control has been consistent. Drought stress reduces effectiveness. Crop tolerance appears very good. May be tank-mixed with bromoxynil; do not apply other broadleaf herbicides within 5 days of Hoelon application. The 2.66 pt/A rate is suggested for most situations. The low rate may be adequate for very small weeds when conditions are favorable. Minimum carrier is 10 gpa for ground and 5 gpa for air. Do not add crop oil concentrate. Do not graze or feed flax straw from treated fields. Restricted Use Pesticide.

HOELON + BUCTRIL (DICLOFOP + BROMOXYNIL) ($18.00-22.25)

2-2.66 pt Hoelon + 1 pt Buctril 2L (.75-1 + .25 act)

FOXTAIL, WILDOATS, SOME ANNUAL BROADLEAVES	Tank-mix. Hoelon provides good to very good control of foxtail and wild oats. Bromoxynil controls annual broadleaves. Weed and crop stage, rates, and application directions are the same as for products used alone. Do not add other herbicides or crop oil concentrate.

POAST (SETHOXYDIM) ($6.20-30.95)

.5-2.5 pt Poast 1.5L (.1-.5 act)

FOXTAIL, WILD OATS, VOLUNTEER CORN	For postemergence grass control. Annual grasses should be treated before they reach 4 inches to minimize competition. Control has been consistent. Drought stress reduces effectiveness. Controls wild proso at .5 pt (4-10 in), barnyardgrass, wild oats and foxtail (to 4 in) and volunteer corn at 1 pt (2-8 in) and volunteer cereals at 1.5 pt (to 6 in). Quackgrass suppression requires 2.5 pt (6-8 in) and may require retreatment. Always add 1 qt/A crop oil concentrate or Dash with Poast. Ammonium sulfate (2.5 lb) or 28% (1 gal) nitrogen solution may be used when not tank-mixed with other herbicides for flax. Ammonium sulfate improves control of volunteer corn, cereals, and wild oats. Minimum carrier is 5 gpa.

POAST + BUCTRIL (SETHOXYDIM + BROMOXYNIL) ($11.30-36.05)

POAST + BUCTRIL + MCPA (SETHOXYDIM + BROMOXYNIL + MCPA) ($12.40-37.15)

.5-2.5 pt Poast 1.5L + 1 pt Buctril 2L (.1-.5 + .25 act)

.5-2.5 pt Poast 1.5L + 1 pt Buctril 2L + .5 pt MCPA 4L (.1-.5 + .25 + .25 act)

Tank mixes. Poast provides very good to excellent control of annual grasses; bromoxynil or bromoxynil + MCPA provide broadleaf control. Results in SDSU tests have been very good. Some temporary leaf burn may be noted. Use crop oil or Dash as for Poast alone. Refer to section for bromoxynil or Poast alone.

TRITICALE

BUCTRIL (BROMOXYNIL) ($5.15-7.80)

1-1.5 pt Buctril 2L (.25-.38 act)

WILD BUCKWHEAT, SUNFLOWER, SOME ANNUAL BROADLEAVES

Contact herbicide. Excellent wild buckwheat control. Not effective on perennials. Very good crop tolerance on small grains. Rate of 1.5 pt Buctril per acre suggested for most situations. Minimum carrier is 10 gpa for ground and 5 gpa for aerial application. Do not graze treated areas for 30 days after application.

TRITICALE. Apply at 2-leaf to early boot crop stage. Combination with MCPA or 2,4-D not labeled.

SMALL GRAIN
(underseeded to alfalfa)

MCPA AMINE ($.80)

.5 pt MCPA amine 4L (.25 act)

LAMBSQUARTERS, MUSTARD, RAGWEED, PIGWEED

Apply when companion crop is in tillered to boot stage and legume seedlings are 2 to 3 inches tall. Not for vetch or clover. Emergency treatment for heavy weed growth. Crop and/or weed canopy reduces risk of crop injury. Check product label.

BUCTRIL (BROMOXYNIL) ($5.15-7.80

1-1.5 pt Buctril 2L (.25-.38 act)

BROADLEAVES

Apply when alfalfa seedlings have 2 trifoliate leaves and weeds are small. Annual broadleaf weeds should not exceed 4 leaves or 2 inches in height. Control of sunflower, cocklebur, wild buckwheat and kochia is very good. Overwintered mustards are not controlled. Some temporary alfalfa leaf burn is noted in warm, humid weather. Temperature should not exceed 70 degrees F for 3 days after application. Do not graze or harvest forage for 30 days after application.

PROSO MILLET

2,4-D AMINE (.60-1.25)

.5-1 pt 2,4-D amine 3.8L (.25-.5 act)

BROADLEAVES

Selective, translocated herbicide for several annual and perennial broadleaved weeds. Very good control of several annual broadleaves; less effective for kochia or wild buckwheat. Good crop tolerance at proper growth stage. Avoid treating at boot to heading. Rate of 1 pt has been satisfactory for most general broadleaved problems. Rate of .5 pt will control small susceptible weeds such as wild mustard. Use maximum rate (1.5 pt) for perennials, if some crop injury can be tolerated. Apply by air or ground. Do not graze dairy or slaughter animals on treated areas for 2 weeks after application. NOTE: Labeling for millet limited to certain products. IR-4 Minor Crop Project.

MILLET. Apply from 5-leaf to early boot stage after crop tillering. Earlier treatment may reduce number of tillers.

AATREX (ATRAZINE) ($1.15-4.60)

1-4 pt AAtrex 4L or .5-2.25 lb AAtrex Nine-O 90WDG (.5-2 act)

SEVERAL ANNUAL BROADLEAVES, SOME ANNUAL GRASSES

Excellent control of several annual broadleaves. Poor to fair control of annual grasses. Risk of injury greatest on light, low organic matter soil and under cold, wet conditions. Stands may be reduced. Use high rate on heavy, clay, high organic matter soil.

Minimum carrier is 10 gpa for ground or 2 gpa for air.

Millet, corn, or sorghum may be planted the following year. Susceptible crops such as soybeans, sunflowers, small grain, or grass/legumes should not be planted the following year. Do not graze or feed forage for 21 days after application.

SHALLOW PREPLANT INCORPORATED. Apply within 2 weeks of planting and incorporate into top 2 inches of soil with a field cultivator or shallow disk during final seedbed preparation. Most consistent application method. Reduced rainfall requirement for activation.

PREEMERGENCE. Requires .75 to 1 inch of rain within one week of application. Less consistent than preplant.

SMALL GRAIN - FALLOW

COMMAND (CLOMAZONE) ($12.75-17.00)

1.5-2 pt Command 4E (.75-1 act)

COMMAND + ATRAZINE (CLOMAZONE + ATRAZINE) ($9.65-15.05)

1-1.5 pt Command 4E + 1-2 pt Atrazine 4L or .6-1.2 lb Atrazine 90WDG (.5-.75 + .5-1 act)

Command alone or in a tank-mix with atrazine is applied preemergence in fallow. Provides residual control of kochia, mustard, wild buckwheat, purselane, and certain other annual broadleaves. Downy brome (cheatgrass) and volunteer wheat are also controlled. Command is especially effective for volunteer wheat control. Minimum carrier is 15 gpa for ground equipment. Drift movement to non-target crops, trees, or gardens can cause bleaching and damage. Use drift reducing additive with low carrier. Do not apply within 1,000 feet of emerged wheat and certain other sensitive plants.

FALLOW. For winter wheat-fallow-winter wheat rotation. Apply Command after wheat harvest but before October 31. Command may also be used when spring wheat is planted after an 18 month fallow period. Do not plant wheat sooner than 9 months after a fall application. Follow rotation precautions for atrazine. Most risk of carry-over is on high pH soil (over 7.5).

TREFLAN (TRIFLURALIN) ($5.50-8.30)

6.25-10 lb Treflan 10G (.66-1 act)

FOXTAIL, SOME ANNUAL BROADLEAVES

Summer fallow to be planted to hard red spring, durum wheat, and barley the following spring. Used for foxtail control during the fallow period and some residual control of foxtail in the following crop. Reports indicate very good control. Also gives fair control of lambsquarters and pigweed. Cultivation or other herbicides required for escaped broadleaves. Granules may be applied into standing stubble or to soil that has been tilled. Reduces the total tillage required during fallow.

Fallow Application. Treflan rate varies according to application date. Rate of Treflan 10% gran for areas receiving greater than 10 inches annual rainfall is 10 lb from April 15 to April 30; 10-8.75 lb from May 1 to May 31; 8.75-7.5 lb from June 1 to June 30; 7.5-6.25 lb from July 1 to July 31; and 6.25-5 lb from August 1 to August 31. Use high rate for beginning of each time period and the low rate late in the period. Areas receiving less than 10 inches annual rainfall should reduce the above rates by 1.25 lb. Incorporate within 24 hours using a tandem disk, field cultivator, or chisel equipped with large sweeps. The second incorporation and additional shallow tillage can be completed whenever escaping weeds make it necessary. Crop seed should be planted 2 inches deep.

GRAMOXONE SUPER or CYCLONE (PARAQUAT) ($4.40-25.60)

1.5-5 pt Gramoxone Super 1.5L or 1-4 pt Cyclone 2L (.25-1 act)

NONSELECTIVE

Paraquat is a nonselective contact herbicide that may be applied before planting until just before crop emerges. No soil residual. Useful for controlling emerged weeds before planting in no-till or reduced tillage systems. May be used before planting barley or wheat. Minimum carrier is 20 gpa for ground or 5 gpa for air. Use 1 pt X-77 spreader per 100 gal of solution. Follow handling precautions, as paraquat is highly toxic. Restricted Use Pesticide.

ROUNDUP (GLYPHOSATE) ($2.55-9.70)
4-16 fl oz Roundup 3L (.1-.38 act)

ROUNDUP + 2,4-D ($3.80-10.95)

LANDMASTER II or LANDMASTER BW(GLYPHOSATE + 2,4-D) ($4.45-8.85)
4-16 fl oz Roundup 3L + 1 pt 2,4-D amine 3.8L (.1-.38 + .5 act)

27-54 fl oz Landmaster II or Landmaster BW

ROUNDUP + BANVEL (GLYPHOSATE + DICAMBA) ($6.45-13.60)

FALLOWMASTER
4-16 fl oz Roundup 3L + .5 pt Banvel 4L (.1-.38 + .25 act)

22-52 fl oz Fallowmaster

LANDMASTER II + BANVEL ($6.30-16.70)
27-54 fl oz Landmaster II + .25-1 pt Banvel 4L

NONSELECTIVE

Roundup is a nonselective, translocated herbicide with no soil residual. It may be applied in stubble after harvest, in fallow, or prior to planting certain crops. Rates are intended primarily for annual grass and volunteer grain. The higher rates give topgrowth suppression of perennials. One to four quarts are required for consistent stand reduction of perennials. The low rate, low carrier volume applications are in 3 to 10 gpa for air. Aerial applications using 1 to 2 gpa have been satisfactory in some situations; however, drift control and coverage of tall or dense weed growth is more difficult. Weeds should be growing actively and not cut at harvest. Straw should be removed or settled. Hard water reduces control, especially at high carrier rates. Addition of ammonium sulfate at 17 lb/100 gal frequently improves results. Add surfactant at 2 to 4 qt/100 gal of solution. Avoid tillage for 1 day after application. Avoid drift to sensitive crops.

ROUNDUP. The product label includes Roundup rates of 8 to 16 fl oz (.5-1 pt) per acre when used alone. Use 8 fl oz for foxtail; 12 fl oz for barnyardgrass, downy brome in cultivated fields, and mustard, volunteer barley, rye and wheat; 16 fl oz for pennycress, shepherds purse, lambsquarters, wild oat, pigweed, witchgrass, and downy brome in no-till systems. Maximum weed size varies from 6 to 18 inches. These rates have provided the most consistent results.

Special state 24(c) label includes lower Roundup rates of 4 to 16 fl oz (.25-1 pt) per acre for special situations when used alone or in combination with 2,4-D or Banvel. The 4 to 6 fl oz rates are limited to use for foxtail and seedling volunteer wheat when conditions are ideal. Follow application directions and use surfactant and ammonium sulfate as described above.

Roundup is a liquid containing 3 lb/gal glyphosate acid equiv per gallon.
Landmaster II is a premix containing 0.9 lb glyphosate (Roundup) + .8 lb 2,4-D isopropylamine acid equiv per gallon.
Landmaster BW is a premix containing 0.9 lb glyphosate (Roundup) + 1.5 lb 2,4-D isopropylamine acid equiv per gallon.
Fallowmaster is a premix containing 1.1 lb glyphosate (Roundup) + .5 lb dicamba (Banvel) acid equiv per gallon.

ROUNDUP + 2,4-D (LANDMASTER II or LANDMASTER BW). Roundup rates for the tank-mix on the product label are 12 to 16 fl oz (.75-1 pt) per acre as suggested for Roundup alone. Add 1 pt 2,4-D amine per acre. Landmaster II or Landmaster BW rates vary according to weed species. Use 27 fl oz for green foxtail only; 40 fl oz for other foxtail species, witchgrass, downy brome in cultivated fields, purslane, lambsquarters, tansy mustard, pigweed, Russian thistle, and volunteer barley, rye, and wheat.; 54 fl oz for barnyardgrass, kochia, wild oat, sandbur, and downy brome in no-till systems. For postharvest application in stubble, use 40 fl oz for downy brome, green foxtail, and volunteer wheat; 54 fl oz for kochia, mustard, pigweed and Russian thistle; 64 fl oz sandbur, barnyardgrass, witchgrass, yellow foxtail and prickly lettuce. These rates give consistent results in most situations. The special state 24(c) label includes Roundup rates as low as 4 to 6 fl oz with .25 to .5 lb 2,4-D per acre for foxtail and wheat seedlings when conditions are ideal. Follow application directions and use of additives as for Roundup alone.

ROUNDUP + BANVEL or FALLOWMASTER. Tank-mix or use Fallowmaster premix. Banvel improves control of annual broadleaves such as kochia and wild buckwheat. Roundup rates on the product label are 12 to 16 fl oz (.75-1 pt) per acre as suggested for specific weeds for Roundup + 2,4-D. Banvel at .25-.38 pt/A may be added to 24 to 54 fl oz Landmaster II for improved kochia, wild buckwheat and pigweed control. The special state 24(c) label includes Roundup rates as low as 4 to 6 fl oz with .12 to .25 lb Banvel per acre when conditions are ideal. Follow application directions and use additives as for Roundup alone. Use .25 to .5 pt Banvel for annuals and .5 to 1 pt per acre to control broadleaved perennial topgrowth. The low Banvel rate is adequate for seedling broadleaves; somewhat higher rate is required for larger kochia. Allow 45 days per pint of Banvel before planting wheat, barley, or oats if over .25 pt/A is used; a 7 to 10 day interval will reduce concern for residual effects with low rates. Fallowmaster rates vary according to weed species. Use 22 fl oz for green foxtail only; 32 fl oz for downy brome, pigweed, witchgrass, other foxtail, kochia, prickly lettuce, and volunteer barley or wheat; 44 fl oz for barnyardgrass, blue mustard, wild oats and Russian thistle. For postharvest application in stubble, use 32 fl oz for downy brome, green foxtail and volunteer wheat; 44 fl oz for kochia; mustard, pigweed, and Russian thistle; 52 fl oz for barnyardgrass, sandbur, witchgrass, yellow foxtail, and prickly lettuce. Delay planting small grain or sorghum for 15 days after application.

WEED RESPONSE TO HERBICIDES

WEED RESPONSE

Weed control percentages are intended as a guide for comparing alternatives. Percentages are estimated based on favorable conditions.

E = Excellent.	90-95%	Usually over 90% Seldom 100%.	Best choice for weed.
G= Good.	80-90%	Sometimes under 80% Seldom over 90%.	Usually satisfactory.
F = Fair.	65-80%	Sometimes under 65% Seldom over 80%.	Sometimes unsatisfactory. Moderate infestation.
M= Marginal.	40-65%	Seldom over 65% Erratic.	Seldom satisfactory. Light infestations only.
P = Poor.		Usually under 40% or no control.	Not recommended.

CROP RESPONSE

Crop response is based on visual symptoms. Early season symptoms do not necessarily cause yield losses.

N = none; VS = very slight; S = slight; M = moderate; H = high
+ = usually high part of range

	WEED RESPONSE									CROP RESPONSE			
HERBICIDE TREATMENT	Foxtail	Wild Oat	Gen. Broadleaves	Wild Buckwheat	Kochia	Sunflower, Cocklebur	Mustard	Canada Thistle*	Field Bindweed*	Oats	Barley	Wheat	Flax
2,4-D ester	P	P	G	F+	F	G+	E	G	G	M	S+	S+	–
2,4-D amine	P	P	G	F	M	G	E	G	G	S	S	S	–
MCPA ester	P	P	F	M	P	F+	E	G	M	VS	VS	VS	S
MCPA amine	P	P	F	M	P	F	E	G	M	VS	VS	VS	S
Banvel+2,4-D or MCPA	P	P	G+	E	G+	G	G	G	F+	–	H	M+	–
Buctril	P	P	F+	E	G	G+	F	P	P	M	VS	VS	M
Bronate	P	P	G+	E	G+	E	G+	F	P	S	VS	VS	–
Avenge	P	G+	P	P	P	P	P	P	P	–	S+	M	–
Hoelon	G+	G+	P	P	P	P	P	P	P	–	M	S+	VS
Assert	P	G+	M	F	M	P	E	P	P	–	VS	VS	–
Far-go	P	G	P	P	P	P	P	P	P	–	VS	S	–
Treflan	G	M+	P	P	P	P	P	P	P	–	VS	VS	M
Buckle	F+	F+	P	P	P	P	P	P	P	–	VS	–	–
Ally	M	P	G+	G+	G+	G	E	M	P	–	S	VS	–
Glean	G	P	E	E	E	E	E	F	M	S	S	VS	–
Harmony	P	P	G+	E	G+	G+	E	M	P	–	VS	VS	–
Tordon + MCPA	P	P	F+	E	M	F+	G	G	F	S	S	S	–
Curtail	P	P	G	F	F	G	G+	E	M	–	S	S	–

* Topgrowth suppression

– = not labeled